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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,687	09/16/2005	Benjamin Hodder	05-738	9577

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EXAMINER

DIACOU, ARI M

ART UNIT	PAPER NUMBER
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3663

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/549,687	Applicant(s) HODDER ET AL.	
	Examiner Ari M. Diacou	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2,3,5-9 and 13-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2,3,5-9 and 13-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. In the remarks filed 3-27-2007, applicant argued the following:
  - A. On page 5, that claim 17 had no art rejection, and now that the 112's have been dealt with, and the claim made independent, claim 17 should be allowed.
  - B. On page 5, that the invention is not the same type of fiber as that of Carter.
  - C. On page 6, that the rejection over Garman is unclear since the Examiner cited the wrong item numbers of Garman – they are the same as from the rejection over Carter.
2. Argument A is unconvincing, claim 17 was unaddressed in error, and is not allowable, see rejection below.
3. Argument B is unconvincing, there is nothing in the claims to prohibit the Examiner's interpretation of the claims.
4. Argument C is moot in view of the new grounds of rejection.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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6. Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Regarding claims 1-18, the preambles call the invention and optical fiber, yet the limitations say that the optical fiber comprises a laser. The examiner suggests that the limitation be changed to "at least one fibre lasing volume". While there do exist fibers that do comprise active materials and electrical conduits. There exists no canonical definition of optical fiber that includes the power supply necessary for an optical fiber to comprise a laser.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 2 is rejected under 35 U.S.C. 102(b) as being anticipated by Carter et al. (USP No. 2002/0191928). Carter discloses an optical fibre comprising

- a first fibre core, the core being doped and having at least one fibre laser,  
[32/132]
- the at least one laser comprising a pair of reflection gratings embedded in the first fibre core to form a lasing volume and [¶ 0058]

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- a second undoped fibre core separated from the first fibre core by cladding material of the optical fibre [40/140]
- wherein the second fibre core is optically coupled to the lasing volume of each of the at least one fibre laser in the first fibre core such that in use pump light from a pump source can propagate down the second fibre core and be coupled into the at least one fibre laser. [¶ 0036]

***Claim Rejections - 35 USC § 103***

9. Claims 2, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garman (USP No. 4955685) in view of Ball (USP No. 5666372), Chang (USP No. 6560247) or Bufetov (USP No. 6625180).

- Regarding claim 2, Garman discloses
  - a first fibre core, the core being doped and having at least one fibre laser, [Fig. 3, #62]
  - a second undoped fibre core separated from the first fibre core by cladding material of the optical fibre [Fig. 3, #68 and #69]
  - wherein the second fibre core is optically coupled to the lasing volume of each of the at least one fibre laser in the first fibre core such that in use pump light from a pump source can propagate down the second fibre core and be coupled into the at least one fibre laser. [Col 4: 38 – Col 5:14]

but fails to disclose:

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- the at least one laser comprising a pair of reflection gratings embedded in the first fibre core to form a lasing volume

The fiber laser art (372/3) is replete with ways to use Bragg gratings in order to create a laser cavity. Ball, Chang and Bufetov each teach a different topology for making a multi-peak laser, by setting up different laser cavities within a fiber using Bragg gratings. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to add a Bragg grating to an amplifying fiber, for the advantage of creating a fiber laser.

- Regarding claim 17, Garman further discloses [Fig. 2, #44]
- Regarding claim 19, Garman further discloses Fig. 3.

10. Claims 3, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garman and others as applied to claims 1 and 2 above, and further in view of Ishikawa (USP No. 2003/0021533). Garman and others disclose the invention with all the limitations of claims 2 and 3, but fail to disclose using Bragg gratings on one core to facilitate coupling to the other core. Ishikawa teaches just that [¶ 0004] [¶ 0033] [¶ 0042]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to modify a dual core fiber by adding a Bragg grating in for the advantage of facilitating coupling between the cores.

11. Claims 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garman and others as applied to claims 1-4 above, and further in view of Ouelette

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(NPL). Garman, and others discloses the invention with all the limitations of claim 2, but fails to disclose additional Bragg gratings. Oulette teaches that Bragg gratings are layers of differently indexed dielectrics, and that the more layers, the greater the reflection. [pg. 38] Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to add additional Bragg gratings, for the advantage of higher reflection.

12. Claim 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garman and others in view of Ouelette as applied to claims 1-5 above, and further in view of Ishikawa (USP No. 2003/0021533). Garman and others disclose the invention with all the limitations of claim 5, but fail to disclose using Bragg gratings on one core to facilitate coupling to the other core. Ishikawa teaches just that [¶ 0004] [¶ 0033] [¶ 0042]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to modify a dual core fiber by adding a Bragg grating in for the advantage of facilitating coupling between the cores.

13. Claim 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garman and others as applied to claim 1 and 2 above, and further in view of Birks (USP No. 2004/0028356). Garman and others disclose the invention with all the limitations of claim 1, but fail to disclose tapering the fiber. Birks teaches tapering an optical fiber to limit the transmitted modes [Fig. 1] [Abstract]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to

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taper and optical fiber for the advantage of limiting the optical modes that are transmitted.

14. Claims 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garman and others as applied to claims 1 and 2 above, and further in view of Harres (USP No. 2004/0071438). Garman and others disclose the invention with all the limitations of claims 1 and 2, but fail to disclose using the fiber laser in a sensor system. Harres teaches a sensor system that tests how much the alignment of any two fiber used in a transmission system changes the transmission characteristics. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to use the device of Harres to test the coupling of the fibers of Garman and others, for the advantage of seeing if it works.

15. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garman and others as applied to claims 1 and 2 above, and further in view of Hiroshi (USP No. 2003/0095767). Garman and others disclose the invention with all the limitations of claims 1 and 2, but fail to disclose a third core. Hiroshi teaches what is well-known in the art) that a three core fiber is good for controlling the dispersion in the fiber [Abstract]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to make a 3 core fiber with the characteristics of Garman and others, for the advantage of a fiber laser that was dispersion optimized.



***Conclusion***

16. While patent drawings are not drawn to scale, relationships clearly shown in the drawings of a reference patent cannot be disregarded in determining the patentability of claims. See In re Mraz, 59 CCPA 866, 455 F.2d 1069, 173 USPQ 25 (1972).

17. The references made herein are done so for the convenience of the applicant. They are in no way intended to be limiting. The prior art should be considered in its entirety.

18. The prior art which is cited but not relied upon is considered pertinent to applicant's disclosure.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ari M. Diacou whose telephone number is (571) 272-5591. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AMD 5/31/2007

  
JACK KEITH  
SUPERVISORY PATENT EXAMINER